AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A method to at least one of reduce a memory space requirement and to increase a processing efficiency in a computerized method of linear algebra processing, said method comprising:

      providing a hybrid full-packed data structure for processing data of a triangular matrix by one or more dense linear algebra (DLA) matrix subroutines designed to process matrix data in a full format, as modified to process matrix data using said hybrid full-packed data structure; and

      converting said data from said triangular matrix into said hybrid full-packed data structure, as follows:

            determining a portion of said triangular matrix data that would comprise a square portion having a dimension approximately one half a dimension of said triangular matrix data;

            fitting a first triangular portion of said triangular matrix data into a first location relative to data of said square portion; and

            fitting a second triangular portion of said triangular matrix data into a second location relative to data of said square portion,

            wherein said first triangular portion, said second triangular portion, and said square portion fit together to form said rectangular data structure,

      wherein said hybrid full-packed data structure provides a rectangular full format data structure for an entirety of said triangular matrix data and said triangular matrix comprises a triangular or symmetric/Hermitian matrix.

2-3. (Canceled)

4. (Currently amended) The method of claim 1, wherein said matrix subroutine designed to

process matrix data in said full format comprises a matrix subroutine of a LAPACK (Linear

Algebra PACKage) software package.

5. (Currently amended) The method of claim 4, wherein said matrix subroutine comprises a

variant of a corresponding full format routine of a level 3 BLAS (Basic Linear Algebra

Subroutine).

6. (Original) The method of claim 5, wherein said level 3 BLAS comprises an L1 kernel routine,

wherein L1 comprises an L1 cache in a computer, said L1 cache comprising a cache

closest to one of a CPU (Central Processing Unit) and an FPU (Floating-Point Processing Unit) in

said computer.

7-9. (Canceled)

10. (Currently amended) An apparatus for linear algebra processing, said apparatus comprising:

a processor for processing a matrix data of a triangular matrix in at least one dense linear

algebra (DLA) matrix subroutine designed to process matrix data in a full format, using a hybrid

full-packed data structure, said DLA matrix subroutine having been modified to process matrix

data using said hybrid full-packed data structure; and

a receiver for receiving said triangular matrix data, said processor further converting said

triangular matrix data into said hybrid full-packed data structure,

wherein said hybrid full-packed data structure comprises:

a square portion of said triangular matrix data;

a first triangular portion of said triangular matrix data; and

a second triangular portion of said triangular matrix data,

wherein said square portion, said first triangular portion, and said second triangular

portion are fitted together to form said rectangular data structure, and

wherein said hybrid full-packed data structure provides a rectangular data structure for an

entirety of said triangular matrix data and said triangular matrix comprises a triangular or

symmetric/Hermitian matrix.

11-12. (Canceled)

13. (Currently amended) The apparatus of claim 10, wherein said at least one matrix subroutine

designed to process matrix data in a full format comprises at least one level 3 BLAS (Basic Linear

Algebra Subroutine) or a matrix subroutine of a LAPACK (Linear Algebra PACKage) or a

comparable software package.

14. (Original) The apparatus of claim 13, wherein said processor comprises one of a CPU

(Central Processing Unit) and an FPU (Floating-Point Processing Unit), said apparatus further

comprising:

an L1 cache, said L1 cache comprising a cache closest to said CPU or said FPU,

wherein said level 3 BLAS comprises an L1 kernel routine.

15. (Currently amended) A ~~signal-bearing~~ <u>machine-readable</u> medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform ~~a method of processing a triangular matrix data in at least one matrix subroutine, using a hybrid full-packed data structure,~~

~~wherein said hybrid full-packed data structure provides a rectangular data structure for an entirety of said triangular matrix data and said triangular matrix comprises a triangular or symmetric/Hermitian matrix~~ <u>the method of claim 1</u>.

16-17. (Canceled)

18. (Currently amended) A method of <u>providing a service, including at least one of:</u>

<u>at least one of solving and applying a scientific/engineering problem;</u>

<u>providing a consultation related thereto;</u>

~~providing a consultation for solving a scientific/engineering problem using said linear algebra software package;~~

transmitting a result of said ~~linear algebra software package~~ <u>at least one of solving and applying a scientific/engineering problem</u> on at least one of a network, a signal-bearing medium containing machine-readable data representing said result, and a printed version representing said result; and

receiving a result of said ~~linear algebra software package~~ <u>at least one of solving and applying a scientific/engineering problem</u> on at least one of a network, a signal-bearing medium containing machine-readable data representing said result, and a printed version representing said result<u>, to be forwarded to a client,</u>

wherein said at least one of solving and applying a scientific/engineering problem, said method comprising comprises at least one of:

using a dense linear algebra (DLA) software package that computes one or more matrix subroutines, wherein said linear algebra software package processes a matrix data of a triangular matrix format matrix, using a full-packed data structure, in at least one full-format matrix subroutine, as modified to use said full-packed data structure,

wherein said hybrid full-packed data structure provides a rectangular data structure for an entirety of data of a triangular matrix, said rectangular data structure allowing said triangular data to be stored in a smaller memory space and allowing said processing to execute more efficiently,

wherein said hybrid full-packed data structure comprises:

a square portion of said triangular matrix data;

a first triangular portion of said triangular matrix data; and

a second triangular portion of said triangular matrix data,

wherein said square portion, said first triangular portion, and said second triangular portion are fitted together to form said rectangular data structure.

19. (Currently amended) The method of claim 18, wherein said linear algebra software package comprises a Linear Algebra PACKage (LAPACK) or comparable software package.

20-25. (Canceled)

26. (Previously presented) The method of claim 1, wherein said triangular matrix data comprises matrix data in a triangular packed format, said hybrid full-packed data structure thereby allowing a faster processing using a modified full format DLA matrix subroutine than is possible using a packed format DLA matrix subroutine.

27. (Previously presented) The method of claim 1, wherein said triangular matrix data comprises matrix data in a triangular full format, said hybrid full-packed data structure thereby allowing a reduction in required memory space by about 100% compared to said triangular full format data.

28. (Previously presented) The method of claim 26, said hybrid full-packed data structure thereby providing a means to eliminate a necessity that processing triangular matrix data in a packed format must be executed by slower DLA subroutines designed for said packed format.